

PARTIAL FOCUSED PUMPING TEST

HARTFORD PETRLEUM RELEASE SITE

INTRODUCTION

Cleanup efforts at the Hartford Petroleum Release Site have resulted in the removal of an estimated 2 million gallons of gasoline by “skimming” gasoline that collects in wells and operation of the SVE system to capture gasoline vapors. However, despite these efforts, gasoline remains trapped more than 30 feet below ground between soil and groundwater as shown on Figure 1. To accelerate the cleanup, the responsible parties including the four oil companies that make up the Hartford Working Group, as well as a fifth company, Apex Oil Company, Inc., are working to design a system that will remove this deeper, trapped gasoline. All work is overseen by the USEPA and Illinois EPA.

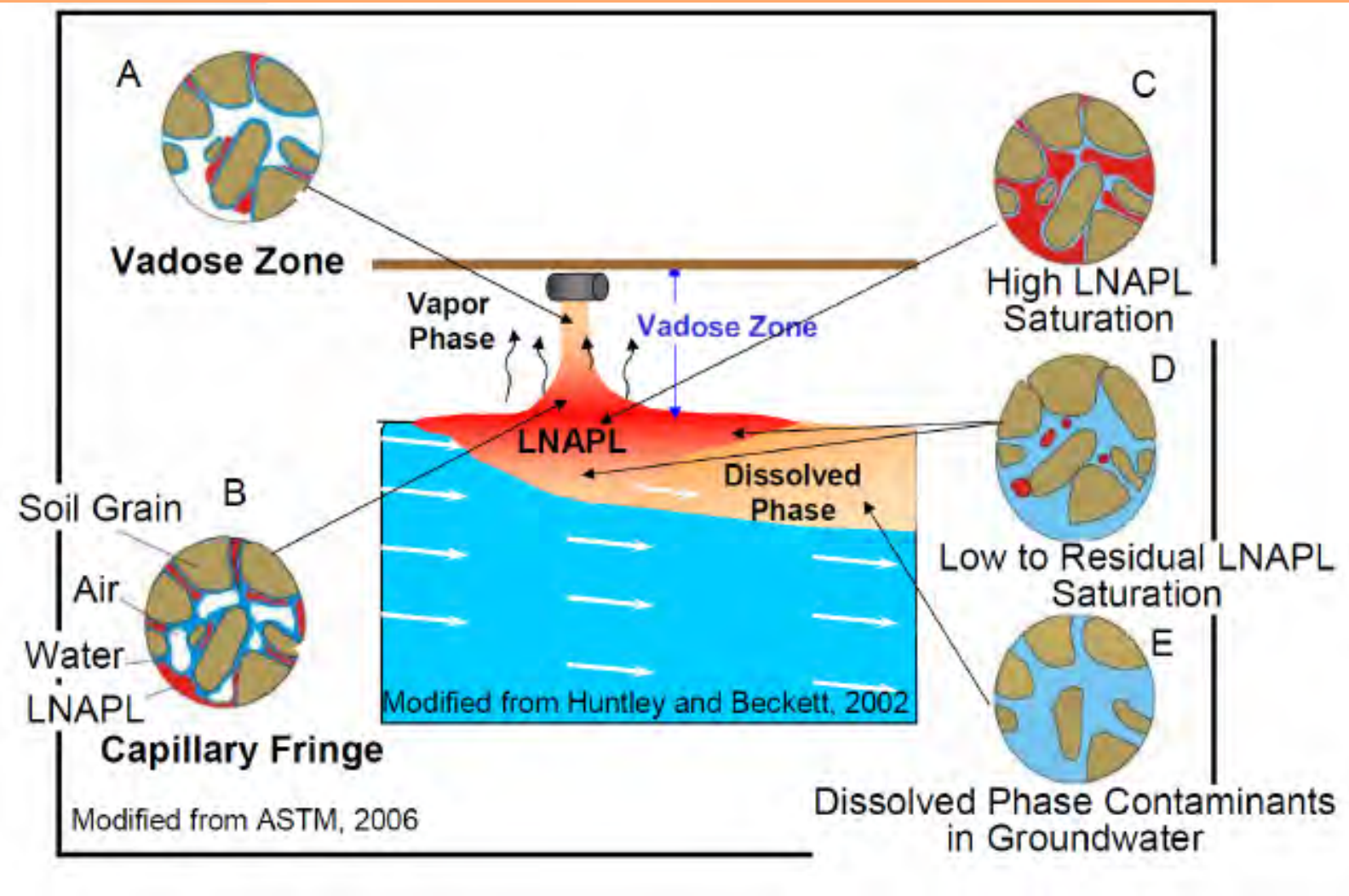


Figure 1. Gasoline Distribution in Soil and Groundwater.

WHAT IS A FOCUSED PUMPING TEST?

A focused pumping test, conducted this past Spring, attempted to remove trapped gasoline from beneath the Hartford Petroleum Release Site. Area A, located along North Olive Street between East Forest and East Elm Streets, was selected as an ideal location to conduct the test (Figure 2). Information indicated that Area A contained large amounts of gasoline deep underground (Figure 3). Focused pumping uses a large diameter well to pump 300 gallons per minute of water out of the ground at a time when groundwater levels are naturally low. This typically occurs in the late Fall or early Winter, when the Mississippi River is low and there is very little rainfall. Focused pumping may help to free the trapped gasoline, which can then be removed by using skimming and vapor extraction.

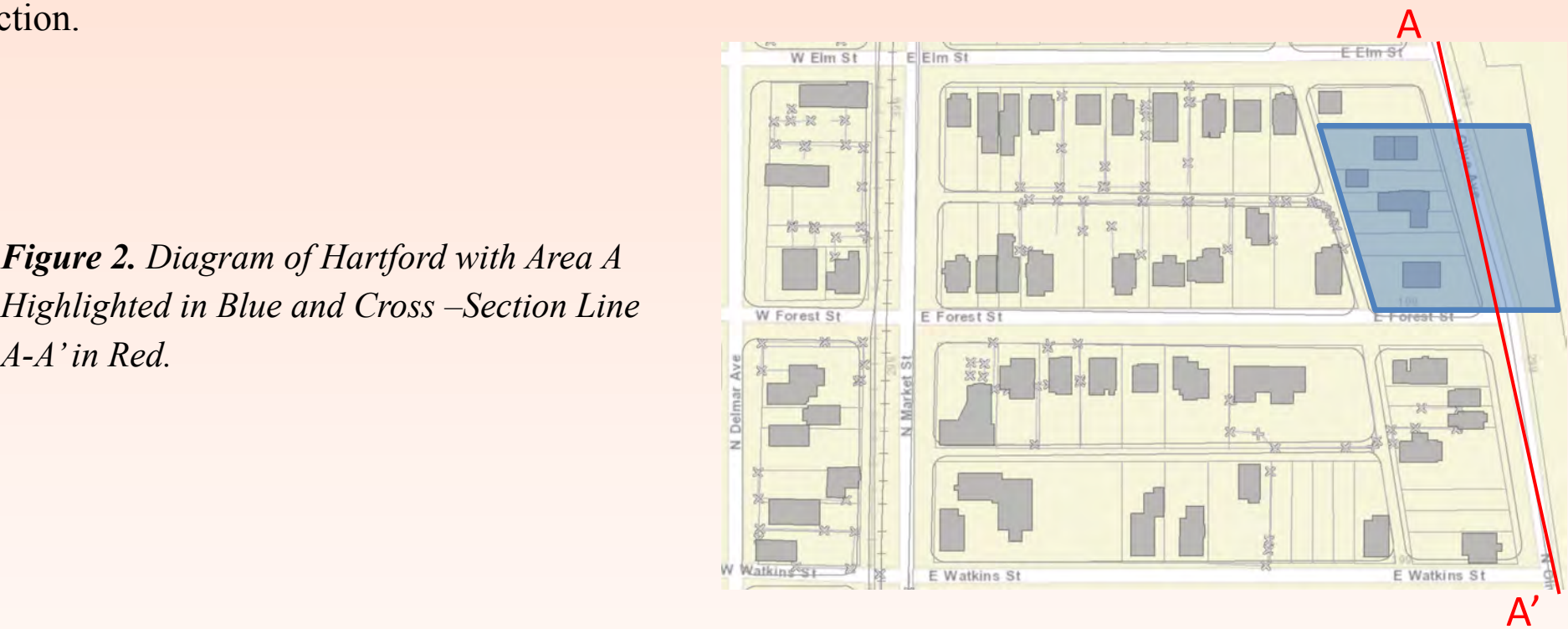
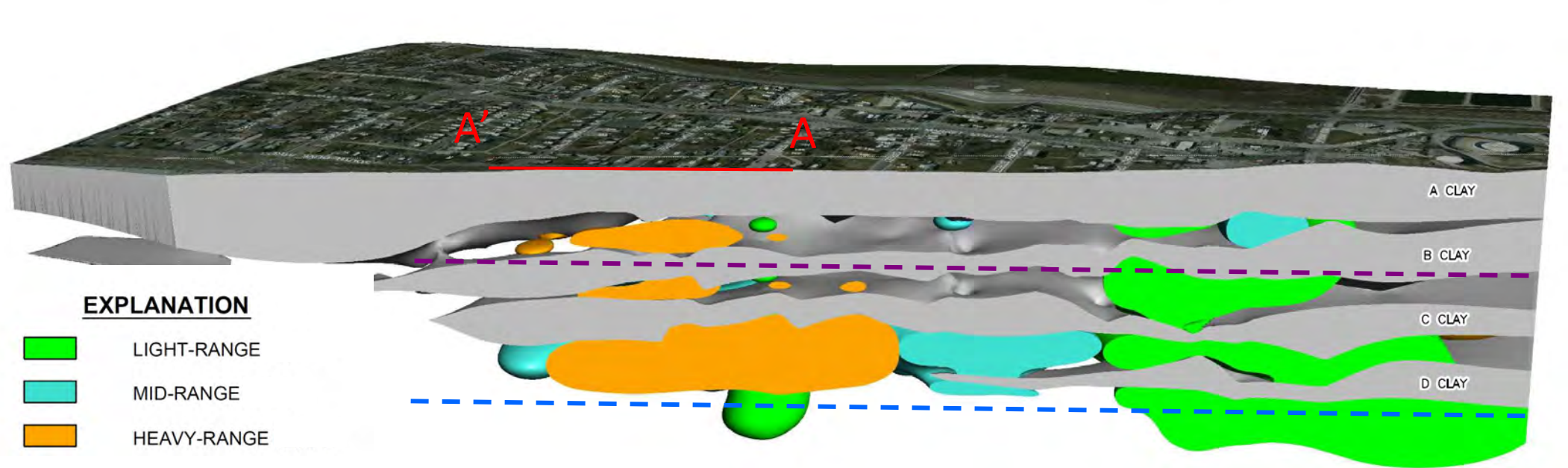


Figure 2. Diagram of Hartford with Area A Highlighted in Blue and Cross-Section Line A-A' in Red.

Figure 3. Diagram of Clay Layers and Different Gasoline Types. Purple Dashed Line Shows Typical High Water Levels and Blue Dashed Line Shows Typical Low Water Levels Without Focused Pumping.



WHY USE FOCUSED PUMPING?

Even though an estimated 2 million gallons of gasoline have been recovered, trapped gasoline remains underground that cannot easily be removed using past methods. One of the challenges to removing gasoline from beneath Hartford is caused by groundwater levels that move up and down at various times of the year depending on factors such as high rain, drought, and the level of the Mississippi River. The up and down movement of groundwater levels causes gasoline to become trapped below the groundwater surface. Focused pumping lowers groundwater levels in a controlled way, which may allow for trapped gasoline to pool around the well, making it easier to remove using skimming and vapor extraction.

Focused pumping takes advantage of the naturally low groundwater levels, and therefore can only be done at certain times of the year when groundwater levels are below an established level. For the focused pumping test, the established groundwater level was 400 feet above mean sea level (about 28 - 30 feet below the ground surface). Only when groundwater was below the “trigger elevation” for an extended period of time would focused pumping be effective (Figure 4).

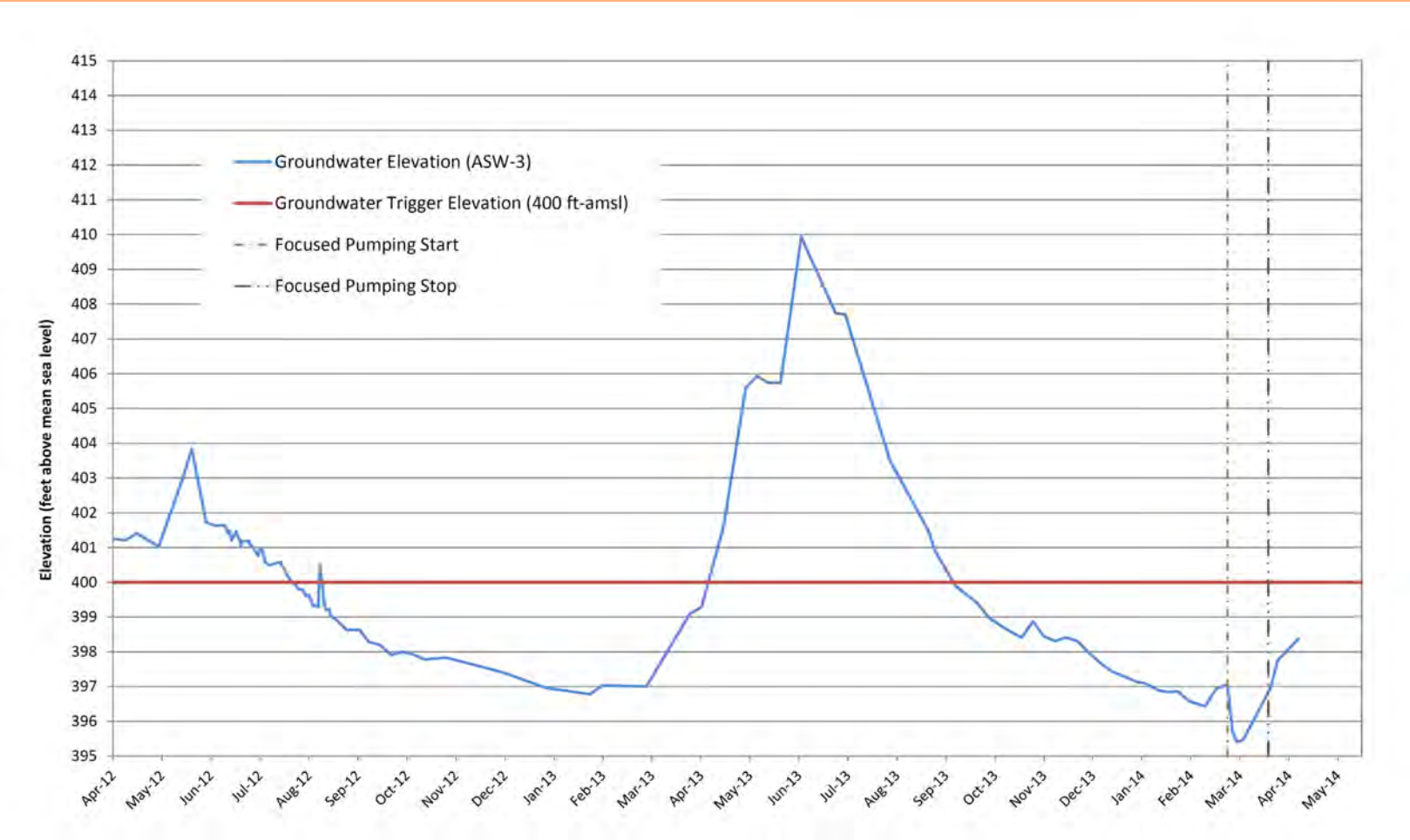


Figure 4. Groundwater Elevation from Trigger Well in Area A.

FOCUSED PUMPING SYSTEM

The focused pumping system contained an on-site groundwater treatment system (Figure 5) to collect and treat groundwater pumped out of the well. Treated groundwater was monitored weekly during the test to ensure only clean water was discharged to the Village of Hartford Sewer System. Results from the monitoring of the treated water indicated that the system effectively cleaned all water discharged to the sewer system. The sewer system was also monitored continuously to ensure gasoline vapors were not coming from the treated water. The treatment system contained automated notifications to the maintenance worker, plus automated shut-downs to ensure safe operation at all times.

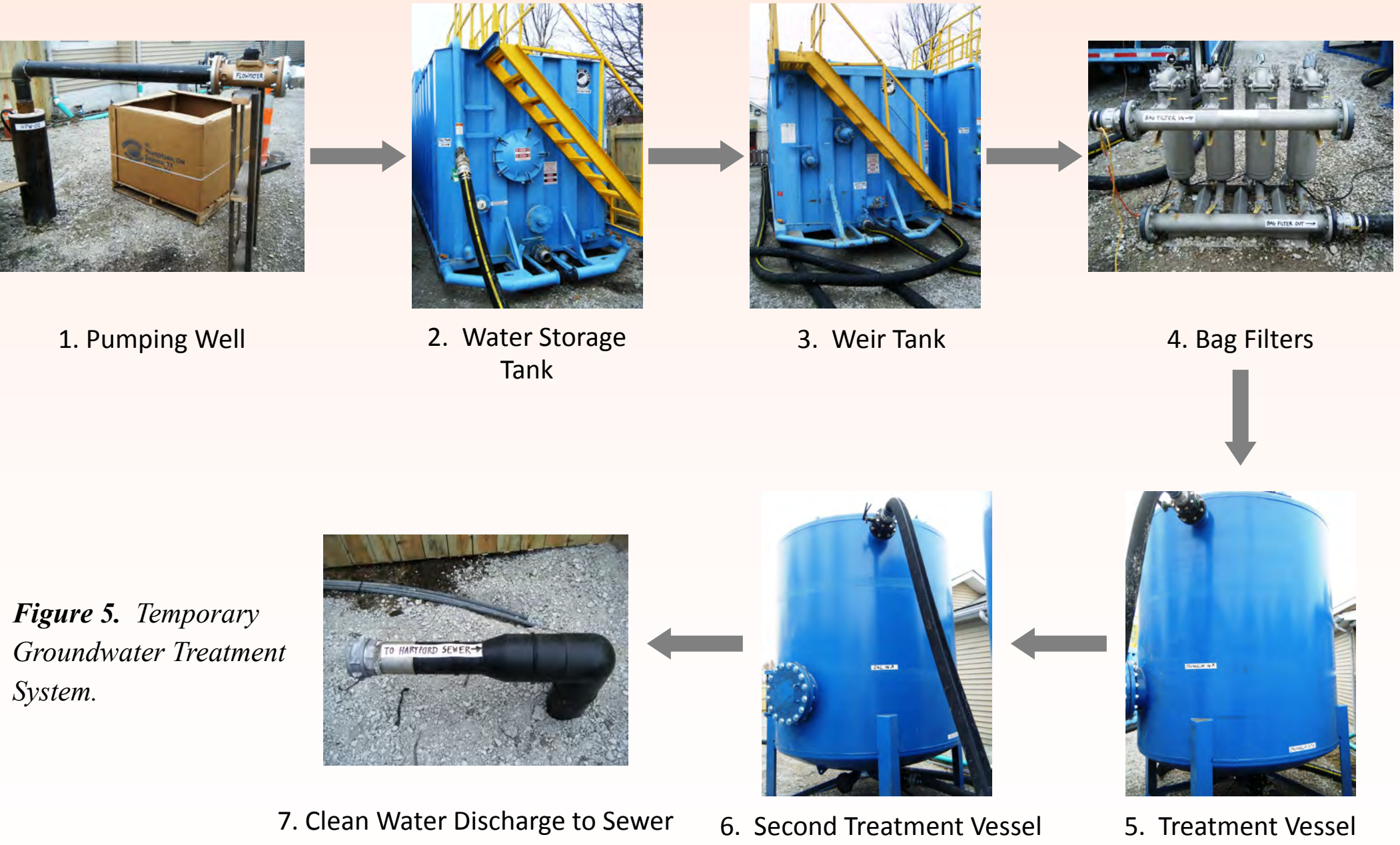


Figure 5. Temporary Groundwater Treatment System.

PARTIAL FOCUSED PUMPING TEST RESULTS

The focused pumping test began in Area A on March 7, 2014 and was stopped on April 2, 2014 due to large amounts of rainfall, rising river levels, and increasing background groundwater levels. Although the test was too short to recover any gasoline, a great deal of information was gained, which will allow for improvements during future testing.

